GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	General Genetics, PG_00037397		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Microbiology -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Anna Stanisławska-Sachadyn	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	1.0	9.0	25

Subject objectives

The objective of the lecture is to convey the key discoveries, principles and terms of genetics to the 1-st year students. The lecture comprises the essential questions of genetics: inheritance of diseases and other traits, the mechanisms of gene expression regulation and genetic variation. The lecture places emphasis on explaining the molecular aspects of genetic inheritance and variation. While presenting the fundamentals of genetics, the lecture comprises a selection of examples
showing a variety of traits, variants, and mechanisms of gene expression regulation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W07	Student has knowledge about the theoretical foundations of general genetics	[SW1] Assessment of factual knowledge
K6_U02	Student can apply the knowledge of the inheritance principles in biotechnology.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
K6_W04	Student knows the fundamental principles of inheritance, the structure and replication of prokaryotic and eukaryotic genomes, the origin and types of mutations and genetic polymorphisms. In addition, Student knows mechanisms of gene expression regulation in Prokaryotes and Eukaryotes, including multicellular organisms and epigenetic mechanisms.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>1.Genetyka przedmendlowska i odkrycia Grzegorza Mendla.
2.Thomas Hunt Morgan; chromosomy, geny sprzężone,
rekombinacja DNA.
3.Dziedziczenie mendlowskie – cechy dominujące i recesywne.
4.Dziedziczenie niemendlowskie
(kodominacja, epistaza) oraz cechy i choroby wielogenowe.
5.Odkrycie roli DNA jako materiału genetycznego, rozwiązanie
struktury DNA i kodu genetycznego.
6.Genom prokariotyczny i jego replikacja. Plazmidy.
7.Genom eukariotyczny i jego
replikacja. DNA mitochondriów i chloroplastów.
8.Powstawanie mutacji i naprawa DNA.
9.Rodzaje i skutki mutacji oraz
polimorfizm genetyczny.
10.Transkrypcja i translacja.
11.Regulacja ekspresji genu – model prokariotyczny.
12.Epigenetyka.
13.Różnorodność eukariotycznych mechanizmów regulacji ekspresji genu. Regulacja ekspresji genów w organizmach
wielokomórkowych – ekspresja tkankowo-specyficzna
14.Test</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>basics of biology at the secondary school level</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>test score</td><td>60.0%</td><td>100.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Lecture print-outs</td></tr>
<tr><td>Supplementary literature</td><td>Leland H. Hartwell, Leroy Hood, Michael L. Goldberg, Ann E. Reynolds, Lee M. Silver Genetics: From Genes to Genomes,
4/e, 2011</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1.Define the terms: homozygote, heterozygote, recesssive and dominant traits, monohybrides and dihibrides.
2.Define allele, resessive and dominant allele
3.Mendel’s experimental setup.
4. Explain the experiment confirming the law of segregation (the 1st Mendel's law).
5. Explain the experiment confirming the law of independent assortment (the 2nd Mendel's law).
6. Punnett's squarea
7. Apomixis in the context of Mendel's studies
8. Are Mendel's laws universal?
9.Mendelian traits in humans
10.Pedigree symbols.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>